

# PATENT COOPERATION TREATY



## PCT

### INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or Agent's file reference IT500WO	<b>FOR FURTHER ACTION</b>	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/DE 02/04509	International filing date ( <i>day/month/year</i> ) 05.12.2002	Priority date ( <i>day/month/year</i> ) 05.12.2002
International Patent Classification (IPC) or national classification and IPC G02B6/42		
Applicant INFINEON TECHNOLOGIES AG et al.		

1.	This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2.	This REPORT consists of a total of 6 sheets including this title page.  <input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Instruction 607 of Administrative Instructions of the PCT).  These annexes consist of a total of 5 sheets.
3.	This report contains indications relating to the following items: <ul style="list-style-type: none"> <li>I <input checked="" type="checkbox"/> Basis of the report</li> <li>II <input type="checkbox"/> Priority</li> <li>III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</li> <li>IV <input type="checkbox"/> Lack of unity of invention</li> <li>V <input checked="" type="checkbox"/> Reasoned statement according to Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</li> <li>VI <input type="checkbox"/> Certain documents cited</li> <li>VII <input type="checkbox"/> Certain defects in the international application</li> <li>VIII <input type="checkbox"/> Certain observations on the international application</li> </ul>

Date of submission of the demand 15.06.2004	Date of completion of this report 21.02.2005
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**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

JC20 Rec'd PCT/PTO 03 JUN 2005  
International application No. PCT/DE 02/04509

**I. Basis of the report**

1. This report has been drawn up on the basis of the following elements (*the replacement sheets received by the receiving office in response to an invitation according to Article 14 are considered in the present report as "originally filed" and are not annexed to the report as they contain no amendments (Rules 70.16 and 70.17).):*

**Description, pages:**

1-14 as originally filed

**Claims, No.:**

1-20 received on 04.01.2005 with the letter of 04.01.2005

**Drawings, sheets:**

1/3-3/3 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

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International application No. PCT/DE 02/04509

5. ☐ This report has been written disregarding (some of) the amendments, which were considered as going beyond the description of the invention, as filed, as is indicated below (Rule 70.2(c)):

*(All replacement sheets comprising amendments of this nature should be indicated in point 1 and attached to this report).*

6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes:	Claims	6-20
	No:	Claims	1-5
Inventive Step (IS)	Yes:	Claims	9
	No:	Claims	6, 7, 8, 10-20
Industrial Applicability (IA)	Yes:	Claims	1-20
	No:	Claims	

**2. Citations and explanations**

**see separate sheet**

**To Item V**

**Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. The analysis below of the novelty and inventive step of the claimed subject matter is based on the following statements under Art. 6 PCT.
  - 1.1 The use of the formulation "optical transmitter and/or receiver assembly comprising at least one transmitter component and/or at least one receiver component" in claim 1 means that an embodiment which comprises only either a transmitter component or a receiver component is also claimed.  
 The characterizing part of the claim, by contrast, uses the formulation "the transmitter component and the receiver component in this case being situated outside the plane ...". This formulation gives the impression that the assembly always comprises a transmitter component and a receiver component.  
 Therefore, the present claim 1 is unclear.  
 It is assumed for the further analysis that the claimed assembly can also comprise either a transmitter component or a receiver component, as suggested by the preamble of the claim.
  - 1.2 The term "planar optical circuit comprising at least one integrated waveguide" also includes laser diodes in which the light is guided in the amplifier material by index or gain guidance.
2. Reference is made below to the following documents cited in the international search report:

D2: EP-A-0 826 995 (HEWLETT PACKARD CO) March 4, 1998 (1998-03-04)

D3: DE 195 19 486 A (BOSCH GMBH ROBERT) November 28, 1996 (1996-11-28)

D4: DE 44 22 322 C (ANT NACHRICHTENTECH) September 14, 1995 (1995-09-14)

D5: GB-A-2 162 336 (MAGNETIC CONTROLS CO) January 29, 1986 (1986-01-29)

D6: US-A-4 726 645 (YAMASHITA JUNICHIRO ET AL.) February 23, 1988

(1988-02-23)

3. The present application does not satisfy the requirements of Article 33(1) PCT because the subject matter of claims 1-5 is not novel in the sense of Article 33(2) PCT.

3.1 D2 discloses an optical transmitter and/or receiver assembly comprising at least one transmitter component or at least one receiver component (41) and also a lens (34), which serves for the optical coupling of the transmitter component or the receiver component to an optical fiber that can be fixed to the transmitter and/or receiver assembly, comprising

a planar optical circuit (31, 39) with at least one integrated waveguide, light being coupled out from the waveguide of the planar optical circuit (31, 39) and being guided onto the receiver component (41),

the receiver component in this case being situated outside the plane in which the integrated waveguide is formed in the planar optical circuit (31, 39),

and the lens (34) being arranged on the planar optical circuit and the light being guided between the lens (34), on the one hand, and the receiver component (41), on the other, in the integrated waveguide of the planar optical circuit.

Therefore, the subject matter of the present claim 1 is not novel with respect to the teachings of D2.

3.2 Further claimed features disclosed in D2:

- pyramidal cutout in the surface of the planar optical circuit (claims 2, 3): D2, figures 3, 5.

- spherical lens (claim 4): D2, figure 3.

- lens adjoining the end area of the waveguide (claim 5): D2, figure 3.

Therefore, the subject matter of the present claims 2-5 is likewise not novel with respect to D2.

4. It furthermore appears that the dependent claims 6-8, 10-20 merely define slight structural changes to the optical arrangement which are known to the person skilled in the art from the prior art or are part of a routine construction process for which the person skilled in the art does not need any inventive abilities (Art. 33(3) PCT).

In this regard, reference is made to the following relevant disclosures in the prior art:

- D2: wavelength-selectively coated mirror areas in an oblique arrangement (claims 8, 10): 36, figure 3.
- D3: Wavelength-selective detection, deflection and coupling-out means (claims 8, 20): column 2, lines 4-16
- D3: Arrangement of a planar circuit (R) on the top side of a substrate (T) and an optoelectronic component (E) on the underside of the substrate (claims 11-13): figure 2 and associated passages
- D4: Receptacle device for receiving the optical fiber, or a ferrule, adjustable metal sleeve (claims 14-17): page 5, lines 6-23
- D5: Index-matched fixing means (claims 6, 18): page 2, lines 98-105
- D6: Planoconvex lens for coupling (claim 7): figures 11, 12

5. It appears, however, that none of the present documents suggests the use of Mach-Zehnder components and deflection prisms for the wavelength-selective coupling-out of radiation from the waveguide onto different detectors.

Therefore, the subject matter of the present claim 9 is regarded as novel and inventive.